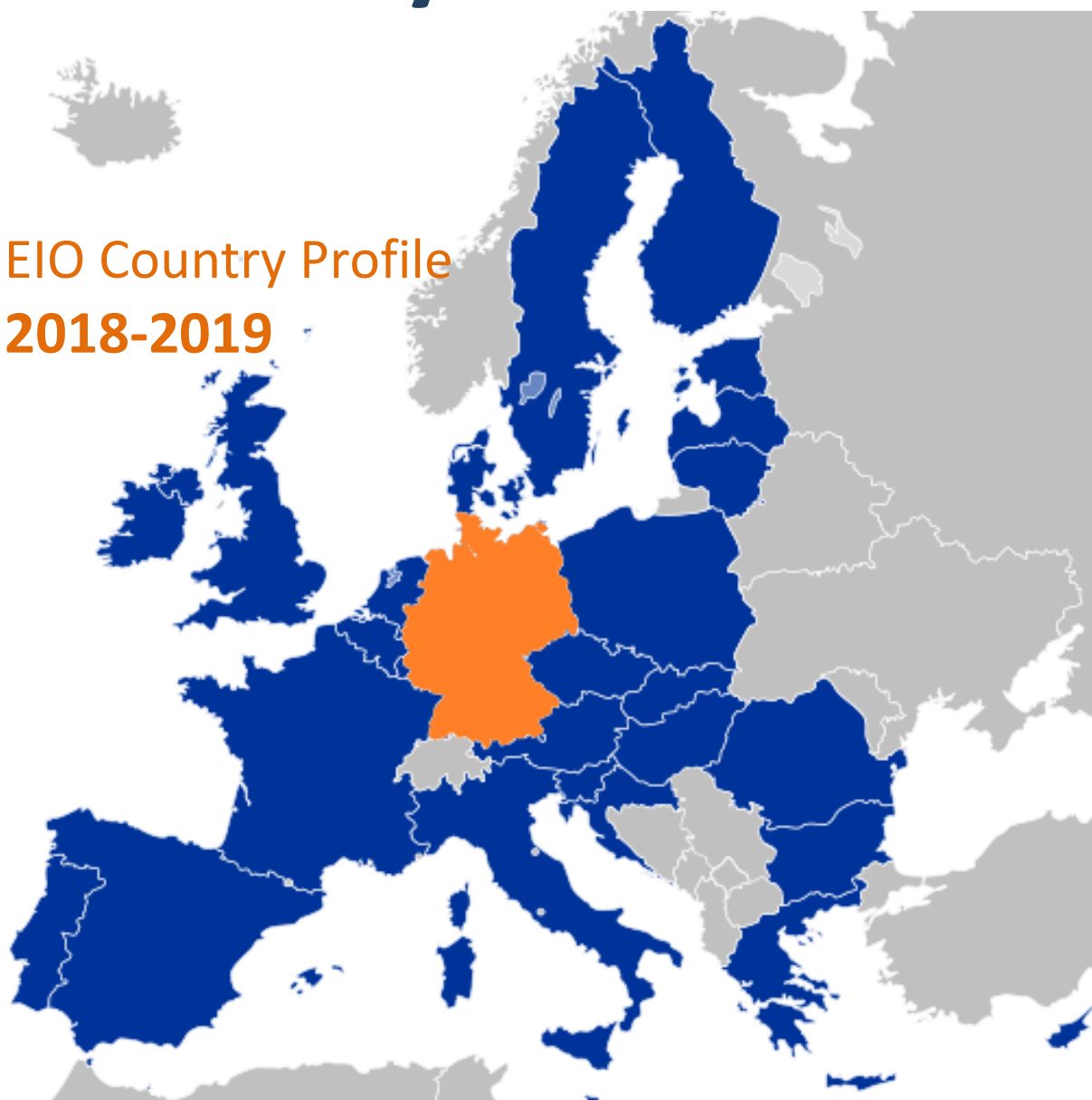


# Eco-innovation in Germany

EIO Country Profile  
**2018-2019**



# Eco-Innovation Observatory

The Eco-Innovation Observatory functions as a platform for the structured collection and analysis of an extensive range of eco-innovation and circular economy information, gathered from across the European Union and key economic regions around the globe, providing a much-needed integrated information source on eco-innovation for companies and innovation service providers, as well as providing a solid decision-making basis for policy development.

The Observatory approaches eco-innovation as a pervasive phenomenon present in all economic sectors and therefore relevant for all types of innovation, defining eco-innovation as:

“Eco-innovation is any innovation that reduces the use of natural resources and decreases the release of harmful substances across the whole life-cycle”.

To find out more, visit [www.eco-innovation.eu](http://www.eco-innovation.eu) and [ec.europa.eu/environment/ecoap](http://ec.europa.eu/environment/ecoap)

Any views or opinions expressed in this report are solely those of the authors and do not necessarily reflect the position of the European Commission.

# Eco-Innovation Observatory

## Country Profile 2018-2019: Germany

Author: Bettina Bahn-Walkowiak

Wuppertal Institute for Climate, Environment and Energy

2020

Coordinator of the work package: Technopolis Group Belgium

## **Acknowledgments**

This brief follows on from the previous country reports of 2016-2017 developed by Meghan O'Brien and 2015 developed by Bettina Bahn-Walkowiak and Henning Wilts.

In addition, this country profile has benefited greatly from a critical review and valuable comments by Ms Malgorzata Kicia (European Commission - DG Environment) and Dr. Anja Meutsch (German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety).

## **A note to Readers**

Any views or opinions expressed in this report are solely those of the authors and do not necessarily reflect the position of the European Union. A number of companies are presented as illustrative examples of eco-innovation in this report. The EIO does not endorse these companies and is not an exhaustive source of information on innovation at the company level.

**This brief is available for download from**

[https://ec.europa.eu/environment/ecoap/country\\_profiles\\_en](https://ec.europa.eu/environment/ecoap/country_profiles_en)

# Table of contents

Summary .....	2
Introduction.....	3
1   Eco-innovation performance .....	4
2   Selected circular economy and eco-innovation areas and new trends .....	7
3   Barriers and drivers to circular economy and eco-innovation in Germany ....	13
4   Policy landscape in Germany.....	15
REFERENCES.....	21
ANNEX: Policy strategies and instruments .....	24

## Summary

Germany's eco-innovation performance has declined compared to previous reports and scores 123 against 100 of the EU average. It is still quite high with respect to the input side of eco-innovation and relatively good, i.e. above EU average concerning socio-economic and eco-innovative outputs. However, the revised eco-innovation index shows weaknesses in eco-innovation activities and environmental outcomes. All in all, Germany ranks 6 this year.

Germany is a well-established frontrunner in the context of waste management, recycling and environmental technologies. Most recently, the increasing attention is put on digitalisation and its potentials for the circular economy and environmental and resource protection. The German Environment Ministry has launched a digital agenda in 2020 (BMU, 2020a).

A strong exporting environmental technology sector, high numbers in patent development, high environmental and safety standards, skilled employees, efficient production chains and a strong industrial sector are a very good basis for driving circular economy and eco-innovation in Germany. Barriers are found in the automotive and mobility sector, which is one of the main pillars of the German economy, and reluctance in the field of environmental regulation and economic instrumentation which slow down the potential dynamics. Further barriers to a circular economy are overcapacities in waste-to-energy facilities and too few incentives for waste prevention.

Germany has not yet developed a dedicated Eco-innovation Action Plan (Eco-AP), nevertheless it has implemented an eco-innovation policy. Several strategies pave the way for eco-innovation, R&D and research and investment but risk to remain on the strategic level as long as they are not flanked by incentives and binding instruments steering the direction. A new R&D programme has just started in order to explore a Resource-efficient circular economy - Building and mineral cycles (ReMin) (2020-2024). The Digital Agenda of the Federal Environment Ministry (2020) newly addresses digitalisation and environmental protection.

# Introduction

A strong exporting sector and a high record in patent development for environmental technologies as well as high environmental and safety standards for disposing waste and highly advanced technical infrastructures for waste sorting systems are clear strengths of the German economy. In specific sectors, for example construction and demolition, glass and paper, recycling rates are extraordinarily high while some streams of the wastes are downcycled or even exported. With respect to circular economy activities such as product design, reuse, repair and extending service life of products, there are large potentials untapped. Reuse rates and the repair markets are still marginal (EEA, 2018; EEA, 2020).

According to the German Federal Environment Agency, the secondary raw materials management is an important component for reducing the use of primary materials now and even more so in future. Based on an analysis of 30 materials and by-products, a recent German study detected a hypothetically higher primary resource use of Domestic Material Input by 13% without any recycling efforts. An equivalent number is presented for the Raw Material Input which would have been 18% higher without recycling in 2013 (Steger et al., 2019). With its large industrial sector and high resource import dependency, Germany has to step up efforts in order to achieve better circular economy results.

In terms of the renewables energy input quota, the German Energiewende (energy transition) is often seen to be a success story. The share of renewable sources in the domestic power consumption has grown from a very low level to 40% in 2019<sup>1</sup>. It is however facing many challenges, particularly regarding the energy-, transport- and buildings-related CO<sub>2</sub> emissions<sup>2</sup>, the transmission network development, with bottlenecks and congestion. Besides, the costs of the system is borne mainly by the households with energy prices are at the highest level in the EU (European Commission, 2019a). Despite the fulfilment of the renewable energy quota, a 2019 expert assessment regards the achievement of the 2020 climate and energy efficiency targets as rather unlikely.

Concerning digitalisation, the German Environment Ministry has just released an Environmental Digital Agenda, a new strategy with a package of 70 measures to develop a climate-friendly digitalisation. The aim is twofold: to steer digitalisation in an environmentally compatible direction and use the opportunities of the digitalisation for environmental protection. Digitalisation is considered a driving force and enabler of the socio-ecological reconfiguration of the economy and society in four essential segments: Industry 4.0 and Circular Economy, mobility, sustainable consumption and environmental protection, agriculture and water resources management (BMU, 2020a). This bears considerable chances for an eco-innovation policy.

---

<sup>1</sup> <https://www.cleanenergywire.org/factsheets/germanys-energy-consumption-and-power-mix-charts>

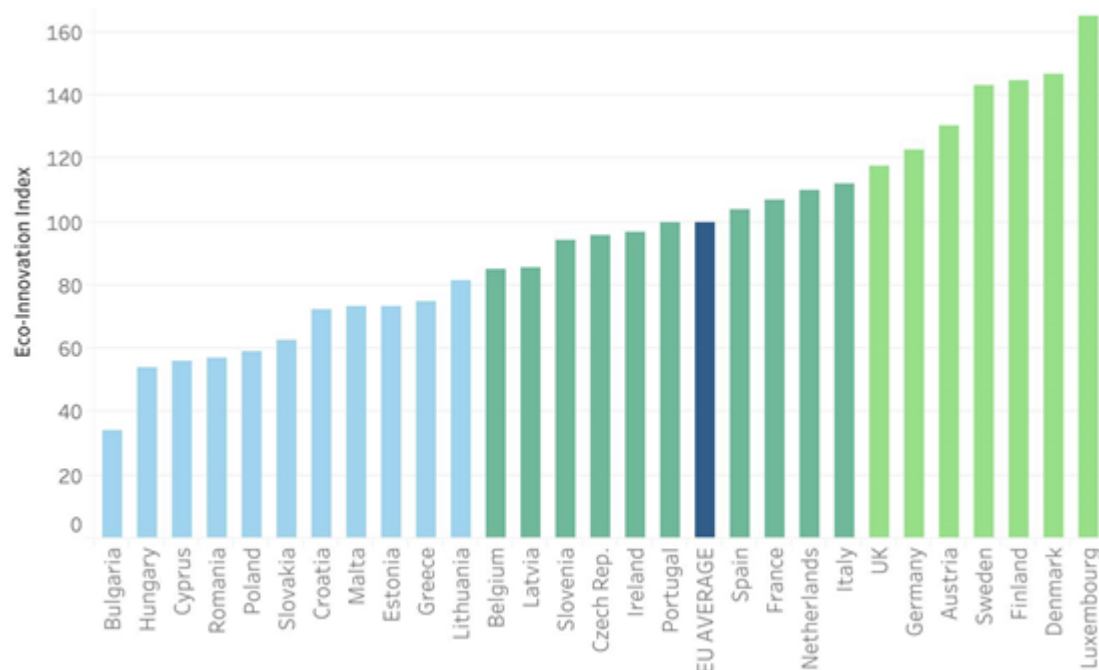
<sup>2</sup> <https://www.cleanenergywire.org/factsheets/germanys-greenhouse-gas-emissions-and-climate-targets>

# 1 | Eco-innovation performance

The analysis in this section is based on the EU 28 Eco-innovation Index (Ecol Index) for the year 2019. The Eco-innovation index demonstrates the eco-innovation performance of a country compared with the EU average and with the EU top performers. Ecol Index is a composite index that is based on 16 indicators which are aggregated into five components: eco-innovation inputs, eco-innovation activities and eco-innovation outputs as well as environmental outcomes and socio-economic outcomes.

Figure 1 shows the overall performance of Germany in comparison to the 27 countries and the EU average. In 2019, Germany ranks six in 2019 Eco-Innovation Index (Figure 1). It has lost three places compared to the 2017 index and six places since 2015 when it ranked first but still counts to the Eco-leaders. Other countries have caught up very significantly. Germany shows above average results in four areas of the index and a below average performance in one section. It has to be noted however that some indicators have been adapted, therefore comparisons with previous years have to be made with some caution.

Figure 1 EU28 Eco-innovation Index 2019, composite index

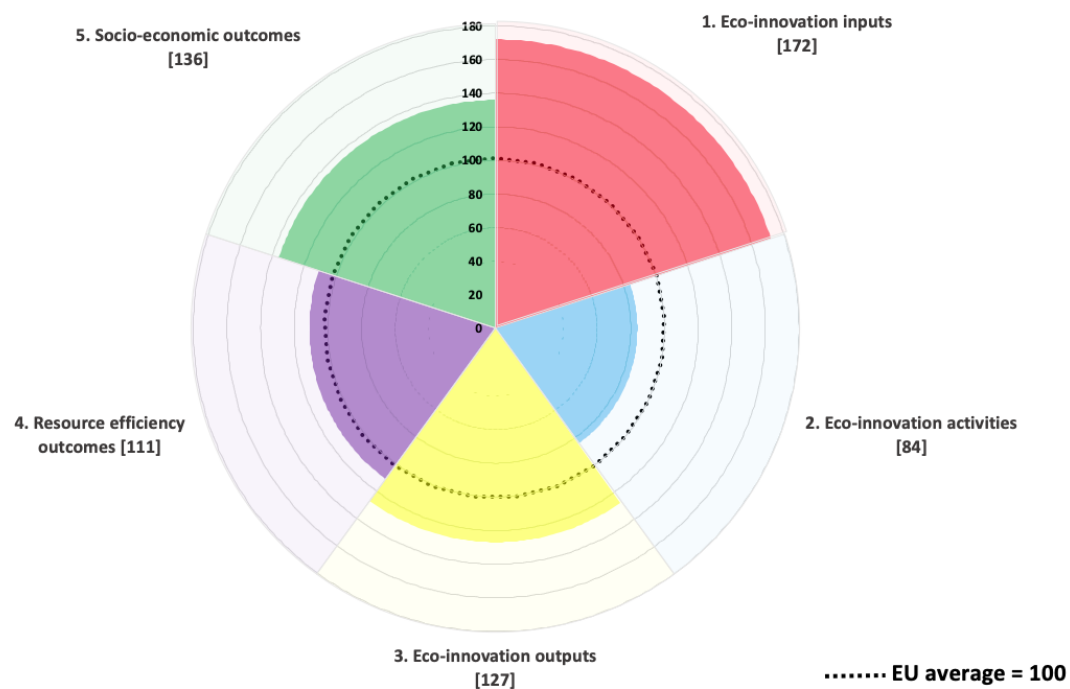


Source: EIO, 2019

In detail (see Figure 2), Germany performs particularly well in indicator **1. Eco-Innovation inputs** (172) (rank 2). 0.08% of the German GDP was spent in 2018 for 'Governmental environmental and energy R&D appropriations and outlays' which is the double of the EU average. The share of 'R&D personnel and researchers in the total employment' (1.78%) is higher than the EU average but remarkably lower than in several other countries, e.g. the Scandinavian countries, Netherlands and Austria. With an average 115 USD/cap, Germany spends quite above-average in 'Total value of green early stage investments in the year 2016-2019'.

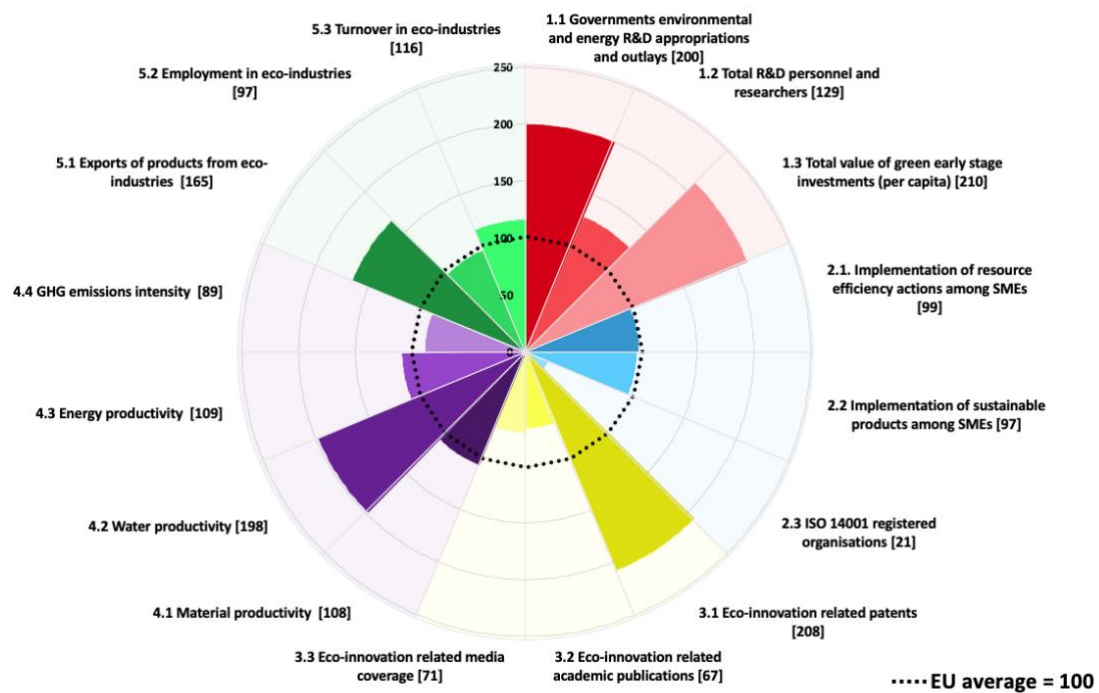


Figure 2 Five components of the Eco-innovation index for Germany, 2019



Source: EIO, 2019

Figure 3 All indicators of the Eco-innovation index for Germany, 2019



Source: EIO, 2019

In contrast, Germany scores particularly poor in the field of **2. Eco-innovation activities** (85) where it does not achieve EU average (rank 18). Two indicators have been adapted depicting a rather average picture for Germany in the context of 'Implementation of resource efficiency actions among SMEs' and 'Implementation of sustainable products among SMEs' as well as a significantly low share of ISO 14001 registered organisations. The latter result however has also turned out in previous years because EMAS registrations are the preferred certification system in Germany.

With respect to **3. Eco-innovation outputs** (127) Germany shows a relatively good above-average performance (rank 7). This is made up of a top performance in the number of 'eco-innovation related patents' which is in contrast to comparably low 'eco-innovation related publications' level as well as a rather low level of 'eco-innovation related media coverage'.

The **4. Resource efficiency outcomes** (111) show a slight above-average picture (rank 13). These indicators are compiled by four components: While material productivity is on average level, water productivity in Germany is clearly high-level while energy productivity is on average level again. The GHG emissions intensity is better than EU average but behind several other larger and smaller EU countries.

In the context of **5. Socio-economic outcomes** (136) Germany (rank 6) performs well in the 'Exports of products from eco-industries as share of total exports' but only average in the numbers for share of 'Employment in environmental protection and resource management activities' of the total workforce. Finally, the 'Value added in environmental protection and resource management activities' measured as percentage of GDP is clearly better than EU average.

In summary, Germany's performance in the Eco-Innovation Index reveals a strong performance on the input side and a relatively good performance in socio-economic and eco-innovation outputs with demand for improvement in relation to publications and media coverage. There is clearly room for improvement in the eco-innovation activities among SMEs and for products and also the resource efficiency outcomes and employment opportunities show still significant scope for progress.

## 2 | Selected circular economy and eco-innovation areas and new trends

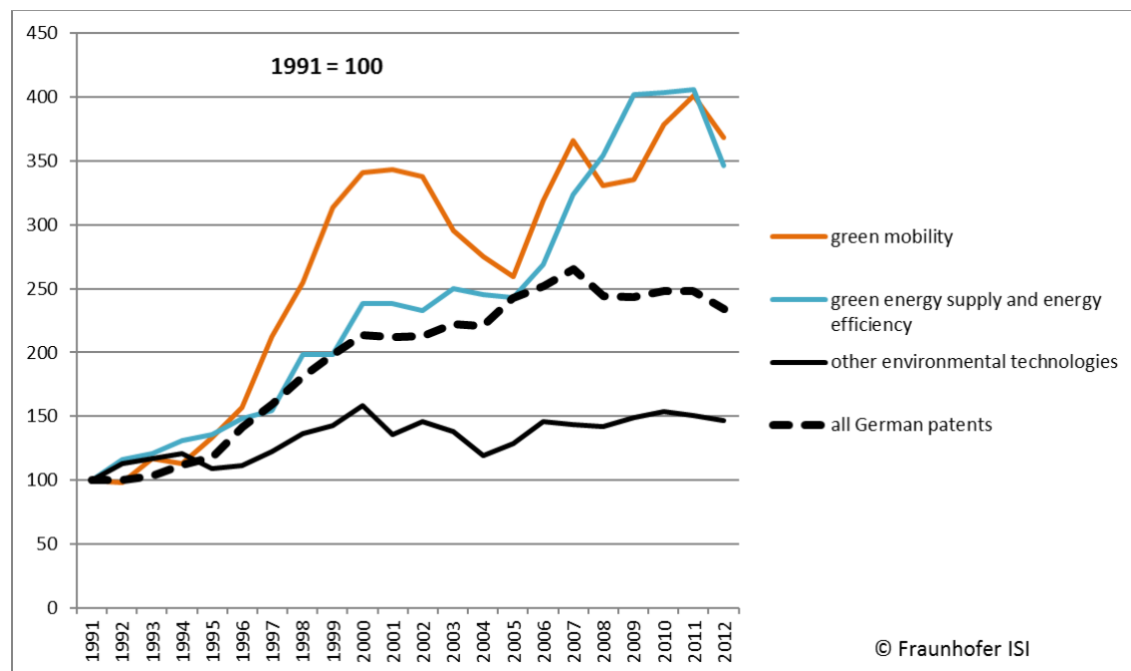
Three fields can be considered important pillars for the German green innovation development: **green tech** including goods and technologies for resource efficiency, technologies for the **energy transition** (so-called “Energiewende”) and **recycling and waste management technologies**. Recycling and waste management is a successful major sector in Germany: Approx. 10,800 enterprises companies are divided into about 6,000 businesses for “Waste collection, transport and street cleaning” and “waste treatment and recycling”. Almost 1,300 companies are counted to the market segment “Technology for Waste Management” and another 3,500 companies are engaged with feeding the cycle of collected and recycled materials from waste management with the trade of secondary materials. Overall, the sector employs almost 290,000 people (BDE et al., 2018). There is also globally a great demand for high-tech solutions (**25% world market share** in waste management technologies) and know-how from Germany<sup>3</sup> (Wilts, 2017; ReTech, 2018). Most recently, the attention increasingly evolves around digitalisation and its potentials for environmental and resource protection and the interfaces with the circular economy. The German Environment Ministry has launched a digital agenda in 2020 (BMU, 2020a).

Environmental protection and innovation have been high on the agenda in Germany for a long time. As the following graph shows **patents** develop steadily, particularly in the context of green energy and green mobility, even stronger since the early 2000s. Germany belongs to a group of technology leaders (UBA, 2019a) and has a large set of active actors in research, economy and politics contributing to Germany's specialisation in patents and foreign trade for environmental technologies. With 13.5 % of worldwide patent applications for environmental protection technologies, Germany, together with Japan and the USA, was among the three most important patent applicants (UBA, 2019c).

---

<sup>3</sup> <http://www.retech-germany.net>

Figure 4: Patent dynamics in Germany in sub-fields relevant for eco-innovation

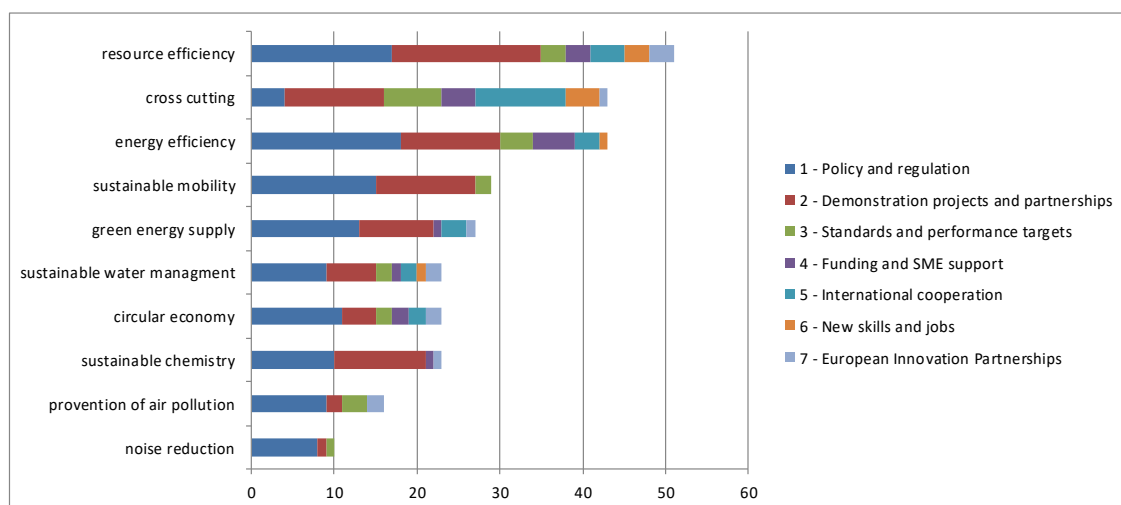


Source: UBA, 2019a, based on Fraunhofer ISI and PATSTAT

The Federal Environment Agency however states a **divergence between energy related eco-innovations and other environmental technologies** and the necessary dynamic for a fundamental transition towards a circular economy. While the energy sector in particular has been able to achieve a significantly above-average increase in the shares of R&D funding and patent dynamics, other environmental technologies are stagnating (UBA, 2019b).

According to a recent study on the German Ecological Innovation Policy, the highest number of individual measures (more than 50) take place in the lead market 'resource efficiency' and another more than 25 measures can be assigned to the circular economy submarket (see figure above).

Figure 5: Number of individual measures by lead market and fields of action



Source: UBA, 2019b (multiple answers were possible)

After the Corona crisis, the ability for the digital transformation might be one of the key competences of the future, not only in Germany. Perhaps, digitalisation and digital technologies can then no longer be understood as a competitive edge only, but as an indispensable common basis for the reorganisation of former industrial societies. The current German High-Tech Strategy 2025 sees “Digitalisation for preventive and personalised medical care”, “Creating sustainable circular economies with a focus on innovative business models”, “Intelligent and emission-free transport and mobility”, “Economy and work 4.0”, inter alia, as relevant areas for future research and innovation policy. It is not clear at this stage how many financial resources can be channelled into these eco-innovation areas at the interface of circular economy and digitalisation, particularly against the background of the German recovery programme which does not specify the above areas.

### National Biodiversity Monitoring Centre

The aim of the monitoring is to close the gaps in knowledge about the state of biodiversity in Germany and to present the possibility of an actual state that is as up-to-date as possible. The tasks of the centre include the evaluation of current data as well as the evaluation of existing but not yet evaluated data from the past. The scope of monitoring goes beyond the documentation of data. In addition to documentation, it should also be possible to derive causal analyses of the status and future development of biodiversity in the form of scenario modelling. The German Institute for Biodiversity Research suggests that monitoring should be managed by a federal authority and embedded in a network of partners with different competencies and responsibilities.

From the iDiv scientists' point of view, biodiversity monitoring should be understood as a service to the general public and not as research. The researchers also recommend that the National Monitoring Centre be established on a permanent basis.

Keywords:

- Biodiversity, Monitoring, Documentation

More information:

- [https://www.idiv.de/en/news/news\\_single\\_view/1453.html](https://www.idiv.de/en/news/news_single_view/1453.html)

Contact:

- [helge.bruehlheide@botanik.uni-halle.de](mailto:helge.bruehlheide@botanik.uni-halle.de)



# iDiv

Source: [www.idiv.de](http://www.idiv.de)

Deutsches Zentrum für integrative Biodiversitätsforschung (iDiv) Halle-Jena-Leipzig

### Promotion of climate protection in data centres

This programme is intended to support local authorities in investing and optimising data centres. These measures can include, for example, the future use of free cooling, heat flow

management or possibilities for waste heat utilisation. The investments will also be used to retrofit or improve hardware components such as servers, cooling systems, cooling systems and emergency power supplies, as well as to carry out energy monitoring.

The implementation of these measures is a prerequisite for the certification of data centres with the "Blue Angel". The programme can also be used to finance staff training.

Among other things, the framework conditions state that special attention should be paid to financially weak municipalities. Schools, kindergartens and applicants from lignite mining areas affected by structural change can also apply for an above-average higher funding rate.

Keywords:

- Data centres, Digitalisation, financing

More information:

- <https://www.ptj.de/projektfoerderung/nationale-klimaschutzinitiative/kommunalrichtlinie/rechenzentren>

Contact:

- [ptj-ksi@fz-juelich.de](mailto:ptj-ksi@fz-juelich.de)

### Sustainabill Cloud Platform

The sustainabill cloud platform offers a number of services and technological solutions to help companies identifying risks in their supply chains and improve the supply chain's sustainability. The tool is applicable to industry and products and enhances visibility, helps to achieve traceability and essentially increases transparency.

Using new and various digitized application-oriented tools (e.g. supply chain visualization, multi-tier visibility, risk heat maps, supply chain mapping & traceability) the supply cloud platform offers solutions contributing to a circular economy, to sustainable sourcing, social compliance and human rights, decrease of climate emissions, and better audit and certification management in industries for textiles, minerals, food and others. The social impact start-up also offers webinars and further information material.

Keywords

- supply chain management, traceability, supply chain transparency

Contact:

- <https://sustainabill.de>
- sustainabill GmbH, 50670 Cologne, Germany,

### An online platform for construction materials - Restado

The mission of restado is to extend the product life cycle of building materials by using building materials as often as possible. In terms of a circular economy, materials can circulate in use and trade and improve their environmental balance.

The online platform is an example of a free marketplace for the trade of unused building materials. The aim of the platform is rescue and reuse building material to conserve scarce

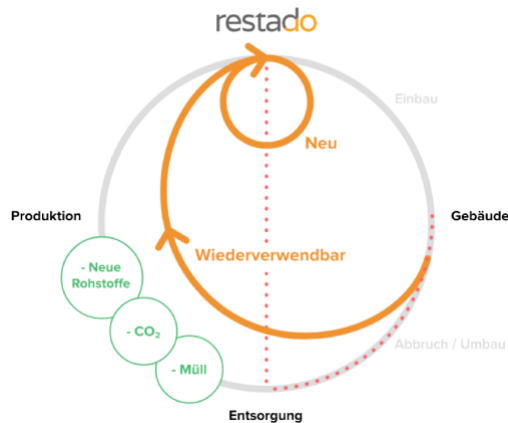
resources, emissions and waste. With every trade via restado you help to preserve our earth.

Keywords:

- building materials, reuse, recycling

More information:

- [www.restado.de](http://www.restado.de)



Contact:

- [info@restado.de](mailto:info@restado.de)

© restado

### Remondis Lippewerk - Center for an industrial circular economy

From 1938 to 1990, the site was home to a production plant of for the production of alumina from bauxite and for the production of aluminum using the electrolysis process. In recent years, the Lippe Plant has been developed into an industrial park and employs over 1,200 people. In addition to the Remondis head office, the 230-hectare site of the Lippe Plant includes a certified laboratory as well as facilities for recycling slaughterhouse waste, waste wood processing / biomass power plant production of gypsum-bearing building products from industrial gypsum, e.g. liquid screed, and a chemical plant for the production of special aluminum salts. Furthermore, plastic granulate is obtained from plastic waste and high-quality metal granulate from slags and furnace waste materials from stainless steel and non-ferrous metal production. There is also a building rubble recycling area, a composting plant and a processing plant for industrial waste to produce so-called substitute fuels for power generation in power plants. Since 2006, biodiesel has also been produced from animal fats and vegetable raw materials, electronic and electrical waste is recycled and a biomass power plant is operated. The plant produces approx. 500,000 tons of raw materials for industrial customers.

Keywords:

- industrial symbiosis, recycling, new technologies

More information:

- [https://www.lwl.org/westfalen-regional-download/PDF/150n\\_M\\_Broschuere\\_REMONDIS-Lippewerk.pdf](https://www.lwl.org/westfalen-regional-download/PDF/150n_M_Broschuere_REMONDIS-Lippewerk.pdf)





## 3 | Barriers and drivers to circular economy and eco-innovation in Germany

### 3.1 Drivers to eco-innovation

Germany's strengths are its high capacity for innovation, highly skilled employees, efficient and precisely timed production chains and a strong industrial sector with a mixture of SMEs, family businesses and large enterprises. Germany has a strong economic market position and a correspondingly good access to capital for investments, and well-established R&D infrastructures to drive eco-businesses and high-tech innovation.

- **Germany as an innovation leader**

In the context of the smart specialisation strategy period 2014-2020, Germany is categorised as an innovation leader. Its smart specialisation priority areas are the manufacturing & industry, key enabling technologies, information & communication technologies, sustainable innovation, and human health & social work activities. In the context of ICT innovation, Germany has 30 fully operational digital innovation hubs and 25 in preparation<sup>4</sup>.

- **Large exporter of environmental goods**

Six per cent of the total industrial production in Germany stems from production of environmental technologies. With a world trade share of 13.6 % Germany was the second largest exporter of environmental goods and technologies in 2017. However, a new report of the Federal Environment Agency on the environmental sector reports that while the pace of innovation is high in the energy sector, there has been no similar velocity of innovation activities in other environmental sectors (UBA 2019c). In the regulation sphere, Germany used to belong to the pioneering countries with respect to environmental standards for decades, but currently appears to limit itself to implementing European requirements and in some cases even accepted contractual penalties for failing to meet targets (e.g. for air pollution control or climate protection).

### 3.2 Barriers to eco-innovation

Germany's manufacturing sector is relatively vulnerable to potential supply shortages because it is highly dependent on raw material imports from the world market, particularly of metals, which are often required for eco-innovation, resource efficiency and circular economy at the material side. This also applies to the chemical sector which revealed to have quite vulnerable global supply chains due to a strong division of labour.

- **Low share of environmental taxes**

In a ranking of environmental taxes in the European countries, Germany only occupies rank 25 with a 1.8% share of environmental tax revenues in the Gross Domestic Product. The highest rate is at 4%. For Germany, three taxes make up the largest share of environmental taxation: the energy and electricity tax and the motor vehicle tax (European Commission, 2019b).

---

<sup>4</sup> [https://ec.europa.eu/regional\\_policy/en/information/publications/factsheets/2017/smart-specialisation-strengthening-innovation-in-germany](https://ec.europa.eu/regional_policy/en/information/publications/factsheets/2017/smart-specialisation-strengthening-innovation-in-germany)

- **Tendency to produce large and heavy vehicles**

A strong path dependency is prevalent in the mobility sector: the vehicle manufacturing system had strong tendency to produce larger and heavier vehicles in the last decade, the subsidised mobility behaviour prefers individual mobility, a growing freight sector uses more trucks than rail, and a growing strong touristic sector shows a dramatic increase of German tourists in cruise liners, all of which contributing to accelerate emissions and resource use.

- **High levels of packaging waste**

Despite an excellent waste management sector and being a pioneer in environmental technologies such as waste sorting, waste-to-energy, waste pre-treatment, Germany has extraordinary high levels of packaging waste (Destatis, 2019).

- **Digitalisation potential not exhausted yet**

In the context of the circular economy, digitalisation offers great potentials for the measurement and assessment of material flows and environmental pollution, as well as in the context of the substitution of critical raw materials and the trade with secondary raw materials and other recyclables, which require a policy framework for design, regulation and R&I support. However, with its complex requirements for consistent implementation, especially with regard to the institutional framework and concrete objectives, this has not yet been sufficiently addressed in Germany (Wilts & Berg, 2017).

## 4 | Policy landscape in Germany

### 4.1 Strategic policy framework

- **Eco-innovation strategies**

Germany has not developed a dedicated **Eco-innovation Action Plan (Eco-AP)** but it has implemented an eco-innovation policy. A recent study investigated the status of the German eco-innovation policy and developed recommendations, based on an inventory of 60 measures comprising 200 single measures in six different green lead markets. Those were analysed in-depth concerning their strength and weaknesses (UBA, 2019b).

- **Circular economy and resource efficiency strategies**

With the launch of the **German Resource Efficiency Programme (ProgRess)** in 2012, which is the authoritative Programme for a sustainable use and the protection of natural resources and its update in 2016, the German government was one of the pioneering countries in this area (, 2012; BMUB, 2016). The programme 2016-2019 comprises 116 different proposals for resource efficiency measures. The waste and circular economy policy realm in the programme was advanced and gained the rank of a focus area besides raw material supply, production, consumption, and overarching instruments. The update of the programme for the period 2020-2023 has just been launched (BMU, 2020b).

Noteworthy is the parallel reporting "The use of natural resources", the reports for 2016 and 2018, which provide comprehensive insights into Germany's consumption of raw materials (UBA, 2016; UBA, 2018).

Although ProgRess also includes significant R&I support approaches, the focus of ProgRess on voluntary instruments for the supply and demand side is a weak point of the programme from a strategic perspective. The topics digitalisation and the circular economy will be taken up more strongly and integrated more clearly in the next update version.

The German **Waste Prevention Programme** is a joint programme of the Federal Government and the Länder to which both levels of action, Federal Government and Länder, are committed. The Waste Prevention Programme (WPP) was adopted in 2013 and addresses waste prevention as one of the primary objectives of waste management. ProgRess and WPP explicitly refer to each other in terms of content. Overarching objectives of both programmes overlap, such as decoupling economic growth and resource use and waste generation and reducing the environmental impacts associated with the use of resources and the generation of waste (Graaf & Jacob, 2017; Wilts et al., 2019; Bahn-Walkowiak et al., 2019).

- **Sustainable consumption and production strategies**

The **National Programme on Sustainable Consumption** (Federal Government 2016/2018) describes the areas of need and the obstacles to sustainable consumption and necessary approaches for action for mobility, nutrition, living and household, work and office, clothing, as well as leisure and tourism. The programme thus contributes to the national implementation of the Sustainable Development Goals (SDGs), in particular concerning Goal 12 "Ensure sustainable consumption and production patterns". The programme however does not formulate specific quantified and binding targets but a number of qualitative nudging approaches. It is envisaged to develop a set of indicators to assess the progress which then could be anchored in the National Sustainability Strategy.

- **Sustainable development strategies**

The **German Sustainability Strategy (DNS)** was first published in 2002 as the National Strategy "Perspectives for Germany" and subsequently updated every four years (2004, 2008, 2012). In 2016, the strategy was reissued in line with the Sustainable Development Goals and updated in 2018, focusing on a "holistic, integrative approach: only if interactions between the three sustainability dimensions of ecology, economy and social issues are taken into account long-term sustainable solutions can be achieved". The UN's Sustainable Development Goals (SDG), which were adopted by the heads of state and government at the UN Sustainability Summit on 25 September 2015 as part of the 2030 Agenda for Sustainable Development, play a key role here. 63 indicators in 36 areas were supplemented by an additional four indicators in 2018 to a total of 67 indicators in two new areas to a total of 38 areas.

- **Other relevant strategies**

In 2020, the German Federal Environment Ministry presented the **Environmental Digital Agenda**, being the first of its kind in Europe, containing more than 70 measures to support a climate-friendly, competitive, and social just digital transformation. Examples are: a Digital Product Pass, a competition for local authorities "The future of sustainable mobility for environmental and climate protection in transport", to develop a regulation for online trade, avoid the destruction of usable but unsold or returned goods, a Biodiversity Monitoring Centre, a laboratory for "Sustainable Digital Agriculture. The aim is to steer the digitalisation in an environmentally compatible direction and to use the opportunities offered for environmental protection at the same time. The BMU worked out the agenda within a broad participation process of around 200 experts. The Digital Agenda is the first strategy in Europe that consistently combines digitisation and environmental protection.

The **Bioeconomy Strategy (2020)** declares the central goal to become increasingly independent of fossil fuels such as coal, oil and gas. The Ministry for Research and the Ministry for Agriculture who developed the strategy together are providing 3.6 billion Euros from 2020 to 2024 for projects and measures relevant to the bio-economy. Further important strategic objectives of are to develop bio-economic solutions for the sustainability agenda, identify and develop the potential of the bio-economy within ecological limits, expand and apply biological knowledge, and orient the resource base of the economy towards sustainability. The strategy does however not refer to potential CAP reforms, necessary restructuring of food chains or reduction of monoculture, etc.

#### **Environmental Digital Agenda (2020)**

The German Federal Environment Ministry presented in early 2020 the Environmental Digital Agenda, which is a strategic package of 70 measures aiming to organise the digital transformation climate-friendly, use it for prosperity and competitiveness, social justice and support an intact environment.

The aim is both to steer digitalisation in an environmentally compatible direction and to use the opportunities offered for environmental protection. The BMU worked out the agenda within a broad participation process of around 200 experts. The Digital Agenda is the first strategy in Europe that consistently combines digitisation and environmental protection.

- Reduce the ecological footprint of digitisation and protect human health
- Digitalisation as a driver for a social-ecological transformation
- Using digital technologies for environmental governance, participation and engagement, and more effective administration, decision-making and enforcement (Environmental Policy 4.0)

- Advance innovation against the background of environmental policy needs, close research gaps and exploit systemic innovation potentials.

Keywords: digital transformation, social-ecological innovation, environmental policy

Internet link:

<https://www.bmu.de/digitalagenda/>

Contact: [stephan.ramesohl@wupperinst.org](mailto:stephan.ramesohl@wupperinst.org)



© Federal Environment Ministry (BMU)

## 4.2 Policy instruments, measures, programmes

Germany has no dedicated circular economy strategy or programme. The waste policy, however, pursues the goal of closed-cycle management and a transformation to a sustainable and resource-efficient management of material flows over the coming years. **The German Closed Substance Cycle and Waste Management Act** (Kreislaufwirtschaftsgesetz, KrWG) has been in force since 2012. The KrWG is supplemented and specified by a large number of legal regulations, e.g. the Packaging Act (VerpackG), the End-of-Life Vehicles Ordinance (AltfahrzeugV), the Battery Act (BatterieG) and the Electrical and Electronic Equipment Act (ElektroG) (sub-legal regulations).

The law implements the EU Waste Framework Directive (EU Directive 2008/98/EC, amended by EU Directive 2018/851) in Germany. The KrWG contains the waste hierarchy as a central statement, i.e. the prioritisation in descending order of avoidance, preparation for re-use, recycling, recovery and disposal of waste materials. The KrWG also set a recycling target: 65 per cent of all municipal waste is to be recycled by 2020. This target was already exceeded in 2016.

The target to double raw material productivity by the year 2020, which was set out in the 2002 sustainability strategy and pursued with **ProgRess I and II (the German Resource Efficiency Programme)** and its measures and activities, will not be achieved. Several studies conclude that binding instruments and strong incentives are needed to achieve a reduction in per capita resource consumption in order to flank circular economy approaches and climate policy in future. Such holistic approach would include fiscal policy instruments such as the urgent restructuring of environmentally harmful subsidies and further development of eco-taxes, further market-based incentives and regulatory approaches for resource conservation, e.g., extension of product life cycles, reuse and repair, as well as for green start-ups and circular business models (SRU, 2020; UBA, 2019b; Steger et al., 2019; Bahn-Walkowiak et al., 2019).

New examples in the context of R&D and eco-innovation are the following programs (further examples are displayed in the Annex):

- High Tech Strategy 2025 (2020)

Under the new High Tech Strategy support for R&I is given for the areas “Health and Care”, “Sustainability, Climate Protection and Energy”, “Mobility”, “Urban and Rural Areas”, “Safety and Security” and “Economy and Work 4.0” and with investment in training and continuing education and the involvement of society.

- FONA Framework Programme (2020-2025) (FONA3)

supports research for sustainability to identify options for a sustainable lifestyle and economy. The programme has new research priorities: three flagship initiatives Green Economy, the City of the Future and the Energy Transition in Germany.

- Resource-efficient circular economy - Building and mineral cycles (ReMin) (2020-2024)

Thematic priorities for funding are: (a) Building in the environmental service branch: New design concepts and innovative building products, (b) Recycling of mineral material flows: construction waste, mining residues, ashes, dusts, slags

- ‘Hightech Digital’ innovation voucher (Baden-Württemberg)

introduced for small and medium-sized enterprises in 2008, in 2017 expanded to ‘Hightech Start-ups to support innovative projects from the growth fields of the future for a maximum of five years after establishment.

### **Resource efficient circular economy - innovative product cycles (ReziProk)**

Initiated by the Federal Ministry of Education and Research, this large research programme has an overall budget size of 30 million Euros, allocation among 27 of projects funded with a duration of 36 months, in the period 2017-2022.

The aim of the research projects is to close product cycles by developing new business models, design concepts and digital technologies and thus contribute to the implementation of a resource-efficient closed-loop economy.

The research results are then to be transferred into economic practice and marketable products as quickly as possible in order to strengthen companies in Germany as competitive suppliers of recycling management solutions.

The projects address a wide range of topics and industries. The projects focus on

- Promotion of the use of recyclates
- Extension or intensification of product use
- Improvement of the recyclability of electric vehicles
- Optimization and expansion of remanufacturing
- Overarching developments on the block chain

Keywords:

- resource-efficient circular economy, innovation.

Internet link:

- <https://innovative-produktkreislaeufe.de>

Contact:

- [katja.wendler@dechema.de](mailto:katja.wendler@dechema.de) / [lea.koenig@dechema.de](mailto:lea.koenig@dechema.de)



© DECHEMA Gesellschaft für Chemische Technik und Biotechnologie e.V. 2020

### Export initiative Environmental Technologies (on-going, 2016)

The Federal Environment Ministry's "Export Initiative Environmental Technologies", which was launched in 2016, aims to disseminate environmental technologies and thus make a concrete contribution to sustainable development and better living conditions in other countries. The environmental policy relevance of sustainable technologies should at the same time facilitate the export of German environmental experience and environmental technologies.

The BMU's "Export Initiative Environmental Technologies" focuses on knowledge transfer and technology transfer, particularly in the BMU's fields of competence. These include, for example:

- water management and wastewater management,
- recycling management as well as waste management and raw materials management,
- resource efficiency,
- wastewater treatment and soil treatment,
- sustainable or energy-saving building and urban development,
- sustainable consumption,
- environmentally friendly mobility,
- air pollution control.

Keywords:

export, environmental technologies, international cooperation

Internet link:

<https://www.exportinitiative-umweltschutz.de/de/foerderung>

Contact:

[exportinitiative@vdivde-it.de](mailto:exportinitiative@vdivde-it.de)



© Federal Environment Ministry (BMU)



## REFERENCES

Bahn-Walkowiak, B.; Koop, C.; Meinel, U.; Nicolas, J.; Wilts, H., 2019, *Evaluation des Deutschen Ressourceneffizienzprogramms ProgRess - Teilbericht*. TEXTE 43/2019. Dessau-Roßlau: Umweltbundesamt. Available at:

<https://www.umweltbundesamt.de/publikationen/evaluation-des-deutschen>

BDE, BDSV, bvse, ITAD, PlasticsEurope Deutschland e.V., VDM, VDMA, VHI, & VKU, 2018, *Statusbericht der deutschen Kreislaufwirtschaft 2018 - Einblicke und Aussichten*. Verband Kommunalen Unternehmen.

BMUB, 2013, *Waste Prevention Programme - of the German Government with the Involvement of the Federal Länder*. Berlin: Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety. Available at: <https://www.bmu.de/en/publication/waste-prevention-programme-of-the-german-government-with-the-involvement-of-the-federal-laender/>

BMUB, 2016, *German Resource Efficiency Programme II - Programme for the sustainable use and conservation of natural resources*. Berlin, Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety. Available at: [https://www.bmu.de/fileadmin/Daten\\_BMU/Pool/Broschueren/german\\_resource\\_efficiency\\_programme\\_ii\\_bf.pdf](https://www.bmu.de/fileadmin/Daten_BMU/Pool/Broschueren/german_resource_efficiency_programme_ii_bf.pdf)

BMU, 2020a, *Umweltpolitische Digitalagenda*. Berlin: Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit. Available at: <https://www.bmu.de/digitalagenda/>

BMU, 2020b, *Deutsches Ressourceneffizienzprogramm III 2020 – 2023 - Programm zur nachhaltigen Nutzung und zum Schutz der natürlichen Ressourcen*. Berlin: Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit. Available at: <https://www.bmu.de/download/deutsches-ressourceneffizienzprogramm-progress-iii/>

Destatis 2019, *Abfallbilanz (Abfallaufkommen/-verbleib, Abfallintensität, Abfallaufkommen nach Wirtschaftszweigen)*. Statistisches Bundesamt. Available at: [https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Umwelt/Abfallwirtschaft/Publikationen/Downloads-Abfallwirtschaft/abfallbilanz-pdf-5321001.pdf?\\_\\_blob=publicationFile&v=5](https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Umwelt/Abfallwirtschaft/Publikationen/Downloads-Abfallwirtschaft/abfallbilanz-pdf-5321001.pdf?__blob=publicationFile&v=5)

EEA, 2018, *Waste prevention in Europe — policies, status and trends in reuse in 2017* (Lead Authors Wilts, Henning; Bahn-Walkowiak, Bettina (ETC-WMGE), and Ybele Hoogeveen (EEA) No 4/2018). European Environment Agency.

EEA, 2020, *Resource efficiency and the circular economy in Europe 2019 – even more from less; An overview of the policies, approaches and targets of 32 European countries* (EEA Report 26/2019). European Environment Agency.

ETC-WMGE, 2019, *Resource efficiency and circular economy in Europe – even more from less An overview of policies, approaches and targets of Germany in 2018*. Eionet Report - ETC/WMGE 2019/4 – Germany. European Topic Centre on Waste and Materials in a Green Economy, Mol, Belgium. Available at: <https://www.eionet.europa.eu/etcs/etc-wmge/products/country-factsheets-on-resource-efficiency-and-circular-economy-in-europe>

European Commission, 2017, *Smart Specialisation - Strengthening innovation in Germany*. Available at : [https://ec.europa.eu/regional\\_policy/sources/docgener/guides/smart\\_spec/strength\\_innov\\_de\\_en.pdf](https://ec.europa.eu/regional_policy/sources/docgener/guides/smart_spec/strength_innov_de_en.pdf)

European Commission, 2019, *The Environmental Implementation Review*. Luxembourg, EC. [http://ec.europa.eu/environment/eir/index\\_en.htm](http://ec.europa.eu/environment/eir/index_en.htm)

European Commission 2019a, *Energy prices and costs in Europe*, COM(2019) 1 final. Brussels, EC. [https://ec.europa.eu/energy/sites/ener/files/epc\\_report\\_final\\_1.pdf](https://ec.europa.eu/energy/sites/ener/files/epc_report_final_1.pdf)

European Commission, 2019b, *Taxation Trends in the European Union: Data for the EU Member States, Iceland and Norway - 2019 Edition*. Brussels, EC. [https://ec.europa.eu/taxation\\_customs/sites/taxation/files/taxation\\_trends\\_report\\_2019.pdf](https://ec.europa.eu/taxation_customs/sites/taxation/files/taxation_trends_report_2019.pdf)

ReTech, 2018, *Modern waste - Goals and Paths; Germany's expertise for an advanced circular economy*. German Recycling Technologies and Waste Management Partnership e.V.

Sander, K., Marscheider-Weidemann, F., Wilts, H., Hobohm, J., Hartfeil, T., Schöps, D., & Heymann, R. 2019, *Abfallwirtschaftliche Produktverantwortung unter Ressourcenschutzaspekten (RePro) - Abschlussbericht (Texte 52/2019)*. Umweltbundesamt.

SRU 2020, *Towards an ambitious environmental policy in Germany and Europe - Summary*. German Advisory Council on the Environment.

Steger, S., Ritthoff, M., Bulach, W., Schüler, D., Kosińska, I., Degreif, S., Dehoust, G., Bergmann, T., Krause, P., & Oetjen-Dehne, R., 2019, *Stoffstromorientierte Ermittlung des Beitrags der Sekundärrohstoffwirtschaft zur Schonung von Primärrohstoffen und Steigerung der Ressourcenproduktivität Abschlussbericht (TEXTE 34/2019)*. Umweltbundesamt.

The Federal Government, 2018, *National Programme on Sustainable Consumption From Sustainable Lifestyles towards Social Change*. Berlin, Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety. Available at: [https://www.bmu.de/fileadmin/Daten\\_BMU/Pool/Broschueren/nachhaltiger\\_konsum\\_broschuere\\_en\\_bf.pdf](https://www.bmu.de/fileadmin/Daten_BMU/Pool/Broschueren/nachhaltiger_konsum_broschuere_en_bf.pdf)

The Federal Government, 2019, *Research and Innovation that Benefit the People - The High Tech-Strategy 2025*. Berlin: Federal Ministry of Education and Research. Available at: <https://www.bmbf.de/de/hightech-strategie-2025.html>

The Federal Government, 2020, *National Bioeconomy Strategy - Summary*. Berlin: Federal Ministry of Education and Research (BMBF) and Federal Ministry of Food and Agriculture (BMEL). Available at: [https://www.bmbf.de/files/bioeconomy\\_strategy.pdf](https://www.bmbf.de/files/bioeconomy_strategy.pdf)

UBA, 2019a, *Innovationsmotor Umweltschutz: Forschung und Patente in Deutschland und im internationalen Vergleich – Aktualisierte Ausgabe 2019*. Reihe Umwelt, Innovation, Beschäftigung 06/2019. Dessau-Roßlau, Berlin. Available at:

<https://www.umweltbundesamt.de/publikationen/innovationsmotor-umweltschutz-forschung-patente-2019>

UBA, 2019b, *Ökologische Innovationspolitik in Deutschland. Fachliche Grundlagen für einen deutschen Öko-Innovationsplan. Reihe Umwelt, Innovation, Beschäftigung 01/2019.* Dessau-Roßlau, Berlin. Available at: <https://www.umweltbundesamt.de/publikationen/oekologische-innovationspolitik-in-deutschland>

UBA, 2019c, *Die Umweltschutzwirtschaft in Deutschland: Produktion, Umsatz und Außenhandel – Aktualisierte Ausgabe 2019. Reihe Umwelt, Innovation, Beschäftigung 05/2019.* Dessau-Roßlau, Berlin. Available at: <https://umweltbundesamt.de/publikationen/die-umweltschutzwirtschaft-in-deutschland-2019>

Wilts, H., Berg, H., 2017, *The digital circular economy : can the digital transformation pave the way for resource-efficient materials cycles?* In: *International Journal of Environmental Sciences and Natural Resources*, Vol. 7, No. 5.

Wilts, H. 2017, *Key challenges for Transformations Towards a Circular Economy - The Status Quo in Germany.* *International Journal of Waste Resources*, 7(1). <https://doi.org/10.4172/2252-5211.1000262>

# ANNEX: Policy strategies and instruments

**Table A1: National Policy strategies**

<i>Name of the policy document (strategy, action plan, roadmap)</i>	<i>Relevance for eco-innovation</i>	<i>Relevance for Circular Economy</i>	<i>Relevance for the innovation chain</i>	<i>Input and process targets</i>	<i>Outcome and impact targets</i>	<i>Relevant implementation or governance system</i>
1 <b>High Tech Strategy 2025, Ministry for Economy, (2020)</b> <a href="https://www.hightech-strategie.de/en/index.html">https://www.hightech-strategie.de/en/index.html</a>	Eco-innovation is among other objectives	cross-cutting, focus is on health and care, Sustainability, climate protection and energy, mobility, urban and rural areas, safety and security, economy and work 4.0	cross-cutting	R&I inputs: no amount specified	Reference to <ul style="list-style-type: none"> <li>Climate Action Plan 2050</li> <li>Doubling raw materials productivity goal by 2030 (compared to 2010)</li> <li>National Research Strategy BioEconomy 2030</li> </ul>	unclear
2 <b>Environmental Digital Agenda, Federal Ministry for the Environment (2020)</b> <a href="https://www.bmu.de/en/digital-policy-agenda-for-the-environment/">https://www.bmu.de/en/digital-policy-agenda-for-the-environment/</a>	digitisation to serve the environment, climate and nature.	Transformation fields:  Industry 4.0 and recycling, Mobility, Sustainable consumption, Nature conservation, agriculture and water management, Climate Protection, Sustainability	<ul style="list-style-type: none"> <li>Idea development</li> <li>R&amp;D and design</li> <li>experimentation</li> <li>demonstration</li> </ul>	more than 70 measures and activities are defined. No investment numbers.	Reference to <ul style="list-style-type: none"> <li>Common Agricultural Policy</li> <li>National Research Strategy BioEconomy 2030</li> <li>National Climate Policy / Paris Agreement</li> <li>National Sustainability Strategy and SDGs</li> </ul>	
<b>Bio-Economy (2020)</b> <a href="https://www.bmbf.de/files/2020_1501_National-Bioeconomy-Strategy_Summary_accessible.pdf">https://www.bmbf.de/files/2020_1501_National-Bioeconomy-Strategy_Summary_accessible.pdf</a>	Eco-innovation is among other objectives	cross-cutting	cross-cutting	<ul style="list-style-type: none"> <li>cross-cutting</li> </ul>	<ul style="list-style-type: none"> <li>Multi-sectoral policy targets</li> <li>SDGs</li> <li>Climate change policy targets</li> </ul>	
3 <b>ProgRess, Federal Ministry for the Environment (2012, 2016, 2020 forthcoming)</b> <a href="https://www.bmu.de/en/topics/economy-products-resources-tourism/resource-efficiency/overview-of-german-">https://www.bmu.de/en/topics/economy-products-resources-tourism/resource-efficiency/overview-of-german-</a>	a programme for the sustainable use and conservation of natural resources. It aims to decouple economic growth from resource use, and as far as possible reduce the environmental damage	cross-cutting but also on <ul style="list-style-type: none"> <li>design</li> <li>repair and maintenance</li> <li>reuse</li> <li>repurpose &amp; remanufacture</li> <li>recycle</li> </ul>	cross-cutting	<ul style="list-style-type: none"> <li>Inputs (e.g. investment in EUR) are not specified.</li> <li>Specification of (mainly voluntary) activities (e.g. engagement of SMEs, stakeholders)</li> </ul>	<ul style="list-style-type: none"> <li>Resource efficiency and circular economy policy targets (binding)</li> </ul>	inter-ministerial body, e.g. National Platform for Resource Efficiency, a Network for Resource Conservation, Virtual Research Network, Citizen Dialogues for Resource Efficiency

<i>Name of the policy document (strategy, action plan, roadmap)</i>		<i>Relevance for eco-innovation</i>	<i>Relevance for Circular Economy</i>	<i>Relevance for the innovation chain</i>	<i>Input and process targets</i>	<i>Outcome and impact targets</i>	<i>Relevant implementation or governance system</i>
	<a href="#">resource-efficiency-programme-progress/</a>	associated with resource extraction. It also looks to strengthen German industrial competitiveness and create a national sense of responsibility for resource consumption.	<ul style="list-style-type: none"> <li>• <i>recovery</i></li> </ul>				
4	<b>National Programme on Sustainable Consumption, Federal Ministry for the Environment (2018)</b>	specifies action fields, illustrates options and obstacles and develops a large number of specific actions for a sustainable consumption policy.	<ul style="list-style-type: none"> <li>• <i>repair and maintenance</i></li> <li>• <i>reuse</i></li> <li>• <i>repurpose &amp; remanufacture</i></li> <li>• <i>recycle</i></li> <li>• <i>recovery</i></li> </ul>	cross-cutting	<ul style="list-style-type: none"> <li>• Activities (e.g. engagement of people)</li> <li>• no financial input specified</li> <li>• no output specified</li> </ul>		

**Table A2: Policy instruments and measures**

Category		Name of instrument	Overall relevance for eco-innovation	Relevance for CE	Relevance for the innovation chain
Direct financial support for eco-innovation					
	Grant funding	<b>FONA Framework Programme (2020-2025) (FONA<sup>3</sup>)</b> <a href="https://www.fona.de/en/about-fona/research-for-sustainable-development.php">https://www.fona.de/en/about-fona/research-for-sustainable-development.php</a>	supports research for sustainability to identify options for a sustainable lifestyle and economy. The programme has new research priorities: three flagship initiatives Green Economy, the City of the Future and the Energy Transition in Germany.	<ul style="list-style-type: none"> <li>• design</li> <li>• repair and maintenance</li> <li>• reuse</li> <li>• repurpose &amp; remanufacture</li> <li>• recycle</li> <li>• recovery</li> <li>• cross-cutting</li> </ul>	<ul style="list-style-type: none"> <li>• Idea development</li> <li>• R&amp;D and design</li> <li>• experimentation</li> <li>• commercialisation</li> <li>• cross-cutting</li> </ul>
		<b>Resource-efficient circular economy - Building and mineral cycles (ReMin) (2020-2024)</b>	Thematic priorities for funding are: (a) Building in the environmental service branch: New design concepts and innovative building products, (b) Recycling of mineral material flows: construction waste, mining residues, ashes, dusts, slags.	<ul style="list-style-type: none"> <li>• design</li> <li>• recycle</li> <li>• recovery</li> </ul>	<ul style="list-style-type: none"> <li>• R&amp;D and design</li> </ul>
		<b>7<sup>th</sup> Energy Research Programme of the Federal Government (2018)</b>	is dedicated to eco-innovation and will fund technological, economic and social innovations to transform the existing energy system in Germany and Europe into a sustainable energy system.	cross-cutting	cross-cutting
	Innovation vouchers	<b>'Hightech Digital' innovation voucher</b> (Baden-Württemberg) <a href="https://www.wirtschaft-digital-bw.de/en/service/hightech-digital-innovation-voucher/">https://www.wirtschaft-digital-bw.de/en/service/hightech-digital-innovation-voucher/</a>	introduced for small and medium-sized enterprises in 2008, in 2017 expanded to 'Hightech Start-ups' to support innovative projects from the growth fields of the future for a maximum of five years after establishment.	cross-cutting	cross-cutting
	Loans and credits	<b>KfW Group</b> (promotional bank) <a href="https://www.kfw.de/KfW-Group/About-KfW/">https://www.kfw.de/KfW-Group/About-KfW/</a>	In 2018, a total financing volume of EUR 75.5 billion was committed. Besides small and medium-sized businesses, environmental and climate protection were another main-focus area, where KfW committed around 40% of the overall promotional business volume.	cross-cutting	cross-cutting
		<b>ERP Start-Up Loan and Universal</b>	available for start-ups and young firms	cross-cutting	cross-cutting

Category		Name of instrument	Overall relevance for eco-innovation	Relevance for CE	Relevance for the innovation chain
		<b>ERP Digitisation and Innovation Loan</b>	serves to finance digitisation and innovation projects and investment and working capital for innovative companies. Funding goes to established commercial companies and to professional service providers.	cross-cutting	cross-cutting
	Publicly co-funded venture capital funds (e.g. start-ups)	<b>High-tech Start-Up Fund (HTGF)</b>	is an early-phase funding programme for highly innovative and technology-oriented companies .	cross-cutting	cross-cutting
	Fellowships and postgraduate loans and scholarships	<b>German Academic Exchange Service (DAAD) (2020/2021)</b>  Development-Related Postgraduate Courses, Educating Professionals for Sustainable Development – Scholarships in Germany  <a href="https://www2.daad.de/downloads/foerderprogramm/file.php?id=5295">https://www2.daad.de/downloads/foerderprogramm/file.php?id=5295</a>	Eco-innovation is among other topics	cross-cutting	cross-cutting
	Equity financing from public banks				
	Other (indicate)				
<b>Indirect support for eco-innovation</b>					
	Tax incentives/relieves for eco-innovation (businesses, R&D activity)	--			
	Tax relief for consumers adopting/ purchasing green technology/products	--			
	Taxation of environmentally harmful technologies	--			

Category		Name of instrument	Overall relevance for eco-innovation	Relevance for CE	Relevance for the innovation chain
	Regulations, targets	<p><b>Erneuerbare Energien Gesetz</b> (Renewable Energies Law) – a fixed compensation for the feed-in of renewable energies (feed-in tariffs) for 15- 20 years incl. a degression</p> <p><b>Biokraftstoffquotengesetz:</b> regulating the blending of biofuels into the fuel for motor vehicles</p> <p><b>Waste management Act</b> , 2012 (incl. 65% of municipal waste to be recycled in 2020. This target has already been exceeded in 2016.)</p>	Eco-innovation among other topics.	<ul style="list-style-type: none"> <li>• <i>recycle</i></li> <li>• <i>recovery</i></li> </ul>	N/A
	Green public procurement	The <b>Competence Centre for Sustainable Procurement</b>	at the Federal Ministry of the Interior (KNB) supports public-sector clients in considering sustainability criteria for procurement projects. Reference guidelines to better implement resource efficiency standards are provided.	cross-cutting	cross-cutting
	Demand subsidies (e.g. eco-vouchers/subsidies for green products)	--			
	Labelling, certification, standards	<b>Blue Angel</b>	The national eco-label scheme facilitates the identification of eco-friendly products (around 12,000 environmentally-friendly products and services from around 1,500 companies have been awarded).	<ul style="list-style-type: none"> <li>• <i>design</i></li> <li>• <i>repair and maintenance</i></li> <li>• <i>reuse</i></li> <li>• <i>recycle</i></li> <li>• <i>recovery</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>R&amp;D and design</i></li> <li>• <i>experimentation</i></li> <li>• <i>commercialisation</i></li> </ul>
	Debt guarantees and risk sharing schemes				
<b>Training, advisory, information support, awareness raising</b>					
	Technology transfer and business advisory services	<b>Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)</b>	a service provider in the field of international cooperation for sustainable development and international education work in the areas resource efficiency, recycling, decentralisation of the natural resource	<i>inter alia,</i> <ul style="list-style-type: none"> <li>• <i>design</i></li> <li>• <i>repair and maintenance</i></li> <li>• <i>reuse</i></li> <li>• <i>repurpose &amp; remanufacture</i></li> <li>• <i>recycle</i></li> </ul>	N/A



Category		Name of instrument	Overall relevance for eco-innovation	Relevance for CE	Relevance for the innovation chain
			management, waste management, resource efficient economy, and sustainable tourism.	<ul style="list-style-type: none"> <li>recovery</li> <li>plus cross-cutting</li> </ul>	
	Business incubation/ accelerations	--			
	Eco-innovation challenges, prizes, awards	<b>German Innovation Prize for Climate and Environment (IKU)</b> (2009), every two years	the German Ministry for the Environment, and the Federation of German Industries (BDI) for ideas that point the way forward in process innovation, environmental technologies, environmentally-friendly goods and services, technology transfer, etc.	cross-cutting, digital transformation	idea development, R&D development, experimentation,
	Training for companies, consumers,	<b>VDI Centre for Resource Efficiency</b> (VDI ZRE) (since 2009)	offers various tools for industrial stakeholders and all sectors, such as resource cost calculation, resource checks, web video magazines, guidelines for resource efficiency, studies, etc.	<ul style="list-style-type: none"> <li>cross-cutting</li> <li>resource efficiency, energy efficiency, climate protection</li> </ul>	<ul style="list-style-type: none"> <li>Idea development</li> <li>R&amp;D and design</li> <li>experimentation</li> <li>demonstration</li> <li>commercialisation</li> <li>cross-cutting</li> </ul>
		<b>The Efficiency Agency NRW (EFA)</b> <a href="https://www.ressourceneffizienz.de/ressourceneffizienz/startpage-en">https://www.ressourceneffizienz.de/ressourceneffizienz/startpage-en</a>	offers the PIUS check (product integrated protection of the environment), resource efficiency consulting, financial advice, networking, education, etc.	<ul style="list-style-type: none"> <li>repurpose &amp; remanufacture</li> <li>recycle</li> <li>recovery</li> <li>cross-cutting</li> </ul>	cross-cutting
	Public awareness campaigns, platforms, and outreach activities	<b>KfW Dossier - Why we need circular economy</b> <a href="https://www.kfw.de/stories/dossier-circular-economy.html">https://www.kfw.de/stories/dossier-circular-economy.html</a>	Eco-innovation is among other topics	<ul style="list-style-type: none"> <li>design</li> <li>repair and maintenance</li> <li>reuse</li> <li>repurpose &amp; remanufacture</li> <li>recycle</li> <li>recovery</li> <li>cross-cutting</li> </ul>	<ul style="list-style-type: none"> <li>Idea development</li> <li>R&amp;D and design</li> <li>experimentation</li> <li>demonstration</li> <li>commercialisation</li> <li>cross-cutting</li> </ul>
	other	<b>Green Tech – Made in Germany campaign</b> <a href="https://www.bmu.de/en/topics/economy-products-resources-tourism/economy-and-environment/?type=rau">https://www.bmu.de/en/topics/economy-products-resources-tourism/economy-and-environment/?type=rau</a>	Dedicated focus is eco-innovation	cross-cutting	cross-cutting
Collaborative platforms and infrastructure					

Category		Name of instrument	Overall relevance for eco-innovation	Relevance for CE	Relevance for the innovation chain
	Clusters, networks, platforms (e.g. industrial symbiosis platforms)	<b>Netzwerk Ressourceneffizienz (NeResS)</b> (2007) <a href="https://www.neress.de/netzwerk/">https://www.neress.de/netzwerk/</a>	bundles interdisciplinary and practice-oriented know-how and experience on resource-conserving production, products and management and serves the mutual information and networking of diverse actors.	<ul style="list-style-type: none"> <li>• <i>resource efficiency</i></li> <li>• <i>recycle</i></li> <li>• <i>recovery</i></li> <li>• <i>cross-cutting</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Idea development</i></li> <li>• <i>R&amp;D and design</i></li> <li>• <i>experimentation</i></li> <li>• <i>demonstration</i></li> <li>• <i>commercialisation</i></li> </ul>
	Dedicated support to new research infrastructure (piloting facilities)				
	other	<b>Network Education for sustainable resource use and resource efficiency (BilResS)</b>	brings together actors within and outside of the education system to anchor the topic in education areas, such as schools, professional training, higher education and technical qualifications.	<ul style="list-style-type: none"> <li>• <i>design</i></li> <li>• <i>repair and maintenance</i></li> <li>• <i>reuse</i></li> <li>• <i>repurpose &amp; remanufacture</i></li> <li>• <i>recycle</i></li> <li>• <i>recovery</i></li> <li>• <i>cross-cutting</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Idea development</i></li> <li>• <i>R&amp;D and design</i></li> </ul>

## About the Eco-Innovation Observatory (EIO)

The Eco-Innovation Observatory (EIO) is the initiative financed by the European Commission's Directorate-General for the Environment. The Observatory is developing an integrated information source and a series of analyses on eco-innovation trends and markets, targeting business, innovation service providers, policy makers as well as researchers and analysts.

Visit EIO and DG ENV EcoAP website and register to get access to more information  
and to access all EIO reports, briefs and databases.

[www.eco-innovation.eu](http://www.eco-innovation.eu)

[ec.europa.eu/environment/ecoap](http://ec.europa.eu/environment/ecoap)